

REMARKS

The present application was filed on March 9, 2001, with claims 1-22. Claims 1-22 are currently pending in the present application. Claims 1 and 20-22 are the independent claims.

Applicants respectfully request reconsideration of the present application in view of the amendments above and the following remarks.

Applicants will initially address the objections to the specification.

The Examiner objects to the specification on the ground that the term “arg” is not defined. Applicants traverse, on the ground that the term in question is a well-known abbreviation for “argument” in the field of mathematics, and therefore need not be explicitly defined in the specification. Applicants direct the Examiner to www.dictionary.com, which provides the following definition for the “arg” term:

arg

argument

Source: *The Free On-line Dictionary of Computing*, ©© 1993-2004 Denis Howe

arg /arg/ n. Abbreviation for “argument” (to a function), used so often as to have become a new word (like “piano” from “pianoforte”). “The sine function takes 1 arg, but the arc-tangent function can take either 1 or 2 args.” Compare param, parm, var.

Source: *Jargon File 4.2.0*

Those skilled in the art will readily recognize that the term “arg” as used in the present specification is an abbreviation for “argument,” and “arg” therefore need not be explicitly defined in the specification. Accordingly, the objection is without merit, and should be withdrawn.

The Examiner also objects to the specification on the ground that the applications cited on page 1, lines 6-12, have matured into patents. This is not entirely correct. Only one of the cited applications has so matured, namely, 09/517,659, while the other remains pending. Applicants have updated this paragraph to reflect the issued patent number.

The Examiner objects to the specification on the ground that the A. Bedekar et al. and P. Bender et al. references cited on pages 1-2 were not submitted with the Information Disclosure

Statement (IDS) filed with the present application. Applicants note that a P. Bender et al. reference having the same title as the P. Bender et al. reference cited in the specification was submitted with the IDS, but apparently not considered by the Examiner. Nonetheless, Applicants have submitted herewith a Supplemental IDS listing the two requested references.

The claim rejections will now be addressed.

Claim 22 stands rejected under 35 U.S.C. §101 as being allegedly directed to non-statutory subject matter. Applicants respectfully traverse. The claim is directed to a machine-readable storage medium. Such a storage medium is an article of manufacture, which is one of the statutory categories explicitly identified in §101. Accordingly, the rejection is believed to be improper, and should be withdrawn. Notwithstanding the traversal, Applicants have amended the claim to clarify that the “one or more programs” are stored on the medium.

Claims 1-22 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly reciting subject matter not enabled by the specification. Applicants respectfully traverse.

With regard to claims 1, 6, 21 and 22, the rejection appears to be based on an alleged failure to define the term “arg.” As Applicants noted above, the term is well understood in the art, and therefore need not be explicitly defined. Accordingly, the objected-to references in the specification to a “maximum-rate user” are believed to be clear.

With regard to claim 7, the limitations in question are described in detail in the specification at, for example, page 11, line 25, to page 13, line 7. See also the experimental results described at page 22, lines 7-11, and page 24, line 26, to page 25, line 14.

With regard to claim 8, the limitations in question are described in detail in the specification at, for example, page 13, line 8, to page 14, line 11. The limitations are further supported by the experimental results described at page 22, lines 6-7, and page 22, line 14, to page 24, line 25.

With regard to claim 17, both Update-Extreme algorithm and Move-to-Average algorithms are described in detail in the specification. An example of a Move-to-Average algorithm is described at page 17, line 12, to page 18, line 20. An example of an Update-Extreme algorithm is one which utilizes the alternative option for selection of a revenue vector update direction described at page 20, line 22, to page 21, line 3.

With regard to claim 19, the Examiner argues that the specification fails to disclose how the identifying and scheduling steps can take into account diversity antennas. The passage at page 29, lines 15-23, states as follows, with emphasis supplied:

As described previously, an adaptive algorithm in accordance with the invention can operate with multiple base stations, such as, e.g., in conjunction with a pair of base stations in a which a decision is to be made between serving one user in each base station or only one user from the two base stations. As another example, consider a single cell in which $K = 4$ transmit diversity antennas are being used on the downlink. Each antenna is assumed to have a distinguishing pilot and the users give some indication as to their rate if they use a certain subset of the antennas. Each user might therefore suggest its “best antenna” and the rate it would achieve if assigned that antenna in a given transmission slot. The adaptive algorithm of the invention may then be used to assign users to antennas, such that a plurality of users may be assigned per transmission slot.

It is believed that the passage in question clearly provides sufficient information to allow one skilled in the art to adapt the identifying and scheduling steps of claim 1 in a straightforward manner to take into account diversity antennas by permitting assignment of different users to different antennas in a given transmission slot.

In view of the foregoing, the §112 rejection is believed to be improper, and should be withdrawn.

Claims 1, 2, 4 and 20-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,914,950 (hereinafter “Tiedemann”).

A proper *prima facie* case of obviousness over a single reference requires that there be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference teachings to reach the claimed invention. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the present §103(a) rejection, in that there is no suggestion or motivation to modify Tiedemann to meet the claim limitations.

Independent claim 1 is directed to a method of scheduling data transmissions in a communication network. The method includes the steps of identifying for a given transmission interval a particular user from among a plurality of users requesting data transmissions, the particular user being identified as a maximum-rate user after application of coefficients of a revenue vector to corresponding feasible rates of the plurality of users, the revenue vector being determined in an iterative manner using an adaptive algorithm; and scheduling a data transmission of the particular user for the given transmission interval.

The Examiner in formulating the §103(a) rejection of claim 1 acknowledges that the Tiedemann reference fails to meet the limitations of claim 1 relating to application of coefficients of a revenue vector to corresponding feasible rates to identify a maximum-rate user. See the Office Action at page 4, second-to-last paragraph. However, the Examiner argues that it would be obvious to modify the Tiedemann teachings to meet the limitations in question. Applicants respectfully disagree.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination “must be based on objective evidence of record” and that “this precedent has been reinforced in myriad decisions, and cannot be dispensed with.” In re Sang-Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that “conclusory statements” by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved “on subjective belief and unknown authority.” Id. at 1343-1344. There has been no showing in the present §103(a) rejection of objective evidence of record that would motivate one skilled in the art to modify Tiedemann in the manner urged by the Examiner. Instead, the Examiner in the last paragraph of page 4 of the Office Action states as follows regarding the motivation to modify Tiedemann:

It would have been obvious to one of ordinary skill in the art at the time of the invention that the equation of Tiedemann performs the same function as the calculation of

the coefficient of revenue vector and furthermore it would have been obvious to write the equation of Tiedemann in vector notation instead of as an equation.

The above-quoted statement of obviousness given by the Examiner in the Office Action is precisely the type of subjective, conclusory statement that the Federal circuit has indicated provides insufficient support for an obviousness rejection. It therefore appears that the modification proffered by the Examiner is based primarily upon impermissible hindsight, given the benefit of the disclosure provided by Applicants, rather than upon any objective evidence of record.

Also, it is not clear exactly what “equation” in Tiedemann the Examiner is referring to, as there are multiple equations in the relied-upon portions. For example, if the “equation” referred to by the Examiner is equation (2) of Tiedemann, the equation is based on a predicted signal-to-noise ratio, an assigned data transmission rate, a system spreading bandwidth, a predicted receive power, and a maximum allowable total received power. Where exactly is the motivation to modify this particular equation to reach the claim limitations which recite that a particular user is identified as a maximum-rate user after application of coefficients of a revenue vector to corresponding feasible rates of a plurality of users? To the contrary, since the rate of the user i in equation (2) of Tiedemann is assigned and therefore known *a priori*, there apparently would be little motivation in such an arrangement to apply coefficients of a revenue vector to identify a maximum-rate user as claimed. Accordingly, Applicants submit that the particular portions of the Tiedemann reference relied upon by the Examiner to formulate the §103(a) rejection teach an entirely different way of scheduling data transmissions, and are therefore more properly viewed as teaching away from the particular limitations of the claimed invention.

Applicants therefore respectfully submit that independent claim 1 is allowable over Tiedemann.

Dependent claims 2 and 4 are believed allowable for at least the reasons identified above with regard to independent claim 1.

Independent claims 20-22 include limitations similar to those of claim 1, and are believed allowable for substantially the same reasons identified above with regard to claim 1.

In view of the above, it is believed that claims 1-22 are in condition for allowance, and such favorable action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, reading "Joseph B. Ryan". The signature is fluid and cursive, with the first name "Joseph" and last name "Ryan" clearly legible.

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Joseph B. Ryan
Attorney for Applicant(s)
Reg. No. 37,922
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-7517